CLAIMS

1. A method for manufacturing high tensile strength steel plate comprising the steps of: casting a steel consisting essentially of 0.02 to 0.18% C, 0.05 to 0.5% Si, 0.5 to 2.0% Mn, 0.005 to 0.1% Al, 0.0005 to 0.008% N, 0.03% or less P, 0.03% or less S, by mass, and balance of Fe and inevitable impurities; hot-rolling the cast steel without cooling the steel to the Ar_3 transformation point or lower temperature, or after reheating the steel to the Ac_3 transformation point or higher temperature, to a specified plate thickness; cooling the steel by direct quenching from the Ar_3 transformation point or higher temperature, or by accelerated cooling, to 400°C or lower temperature; and then tempering the steel, using a heating apparatus being installed directly connecting the manufacturing line containing a rolling mill and a direct-quenching apparatus or an accelerated cooling apparatus, to 520°C or above of the maximum ultimate temperature at the plate thickness center portion at an average temperature-rising rate of 1°C /s or larger at the plate thickness center portion up to a specified tempering temperature between 460°C and the Ac_1 transformation point.

2. A method for manufacturing high tensile strength steel plate comprising the steps of: casting a steel consisting essentially of 0.02 to 0.18% C, 0.05 to 0.5% Si, 0.5 to 2.0% Mn, 0.005 to 0.1% Al, 0.0005 to 0.008% N, 0.03% or less P, 0.03% or less S, by mass, and balance of Fe and inevitable impurities;

hot-rolling the cast steel without cooling the steel to the Ar_3 transformation point or lower temperature, or after reheating the steel to the Ac_3 transformation point or higher temperature, to a specified plate thickness; cooling the steel by direct quenching from the Ar_3 transformation point or higher temperature, or by accelerated cooling, to 400°C or lower temperature; and then tempering the steel, using a heating apparatus being installed directly connecting the manufacturing line containing a rolling mill and a direct-quenching apparatus or an accelerated cooling apparatus, to 520°C or above of the maximum ultimate temperature at the plate thickness center portion at an average temperature-rising rate of smaller than 1°C /s at the plate thickness center portion between the tempering-start temperature and 460°C, and at an average temperature-rising rate of 1°C /s or larger at the plate thickness center portion up to a specified tempering temperature between 460°C and the Ac_1 transformation point.

3. The method for manufacturing high tensile strength steel plate according to claim 1 or claim 2, wherein the steel further contains one or more of 2% or less Cu, 4% or less Ni, 2% or less Cr, and 1% or less Mo, by mass.

4. The method for manufacturing high tensile strength steel plate according to any of claims 1 to 3, wherein the steel further contains one or more of 0.05% or less Nb, 0.5% or less V, and 0.03% or less Ti, by mass.

5. The method for manufacturing high tensile strength steel plate according to any of claims 1 to 4, wherein the steel further contains one or more of 0.003% or less B, 0.01% or less Ca, 0.02% or less REM, and 0.01% or less Mg, by mass.

6. A steel plate manufactured by the manufacturing method according to any of claims 1 to 5 being a high tensile strength steel plate for stress relief annealing.